

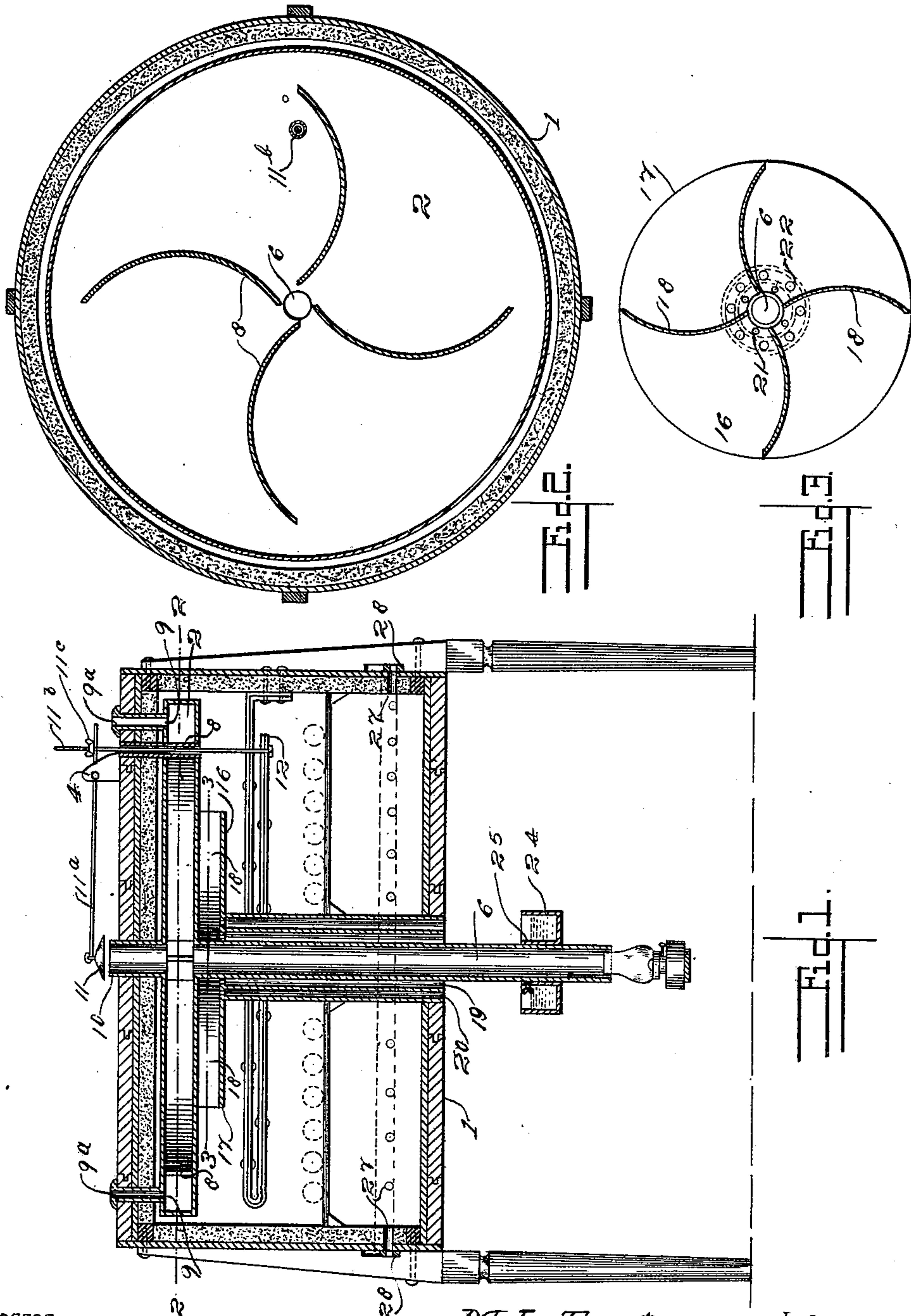
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Patented Apr. 16, 1901.

M. L. TRESTER.
INCUBATOR.

(Application filed Oct. 2, 1900.)

(No Model.)



Witnesses
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UNITED STATES PATENT OFFICE.

MILTON L. TRESTER, OF LINCOLN, NEBRASKA.

INCUBATOR.

SPECIFICATION forming part of Letters Patent No. 672,155, dated April 16, 1901.

Application filed October 2, 1900. Serial No. 31,762. (No model.)

To all whom it may concern.

Be it known that I, MILTON L. TRESTER, a citizen of the United States, residing at Lincoln, in the county of Lancaster and State of Nebraska, have invented a new and useful Incubator, of which the following is a specification.

The invention relates to improvements in incubators.

One object of the present invention is to improve the construction of incubators and to provide a simple and comparatively inexpensive one adapted to be uniformly heated at a minimum cost and capable of supplying the egg chamber or compartment with pure moist air and of uniformly distributing the same throughout the incubator, so that it will be thoroughly diffused around the eggs.

Another object of the invention is to enable the amount of moist air to be readily controlled and to arrange the water-receptacle on the exterior of the incubator, so that it will be surrounded by pure air and at the same time be readily accessible.

The invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

In the drawings, Figure 1 is a vertical sectional view of an incubator constructed in accordance with this invention. Fig. 2 is a horizontal sectional view on line 2 2 of Fig. 1. Fig. 3 is a similar view on line 3 3 of Fig. 1.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates a cylindrical body or casing provided at its top and sides with a lining of mineral wool or other suitable material, which will render the walls and top impervious to air, and the said body or casing is designed to be supplied with suitable trays for the reception of the eggs to be hatched. The trays, as indicated in Fig. 1 of the accompanying drawings, are designed to be located in the lower portion of the body or casing, and they may be disposed in any suitable manner, but are preferably annular to conform to the configuration of the casing. In practice the trays will be preferably mounted for rotation in order that all portions of the trays may be

readily brought around to the door of the casing, and they may be constructed of sections to facilitate their ready removal.

Within the casing, at the top thereof, is arranged a drum 2 of substantially the same area as the top of the casing and located directly beneath the lining of mineral wool, as clearly illustrated in Fig. 2 of the accompanying drawings, and provided with a central vertical flue 6, extending downward from the bottom of the drum through an opening in the bottom of the casing and depending a considerable distance below the latter. The lower end of the flue 6 hangs over a common coal-oil lamp or other suitable heating device, the heat passing upward through the flue 6, and the upward draft of hot air acquires considerable force before it enters the drum at the top of the body or casing. Within the hot-air drum 2, which is shallow, is arranged a series of radially-disposed curved flanges or partitions 8, disposed substantially similar to the blades of a turbine wheel and adapted to throw the hot air outward and cause the circulation of the same, whereby the drum will be uniformly heated. The hot air passing upward through the flue will force the hot air outward through the spaces between the curved walls or partitions 8, so that a positive circulation is effected. The top of the drum is provided at intervals with openings 9, located near the outer wall or periphery of the drum, which is also provided with a central opening, from which extends a short pipe 10, located in alinement with the flue 6. A damper 11 is arranged above the short pipe 10, which forms the upper section of the flue, and the said damper is hung from one end of a lever 11^a, which is fulcrumed near its outer end in suitable bearings of a support 4. The outer end of the lever is connected by a rod 11^b with a thermostat 12, located in the egg compartment or chamber, as clearly shown in Fig. 1. When the damper is raised and the upper end of the pipe 10 is open, the heat passes directly out through the flue and does not enter the hot-air drum or heat the incubator; but when the damper is closed the heat is whirled around in the drum and is thoroughly utilized before it is permitted to escape. The heat escapes at the periphery of the drum through short

vertical outer flues or pipes 9^a, extending upward from the openings 9 through the top wall of the body or casing. The thermostat 12 may be constructed of any different kinds
 5 of metal of unequal expansion and contraction of the heat and cold, aluminium and steel being preferred. The two strips of metal are riveted, soldered, or otherwise secured together, and the thermostat, which is ap-
 10 proximately U-shaped, is doubled between its ends to provide the necessary length of material and to arrange it compactly within the incubator. One end of the thermostat is secured to the casing by screws or other suit-
 15 able fastening devices, and the other end is connected with the lower end of the rod 11^b. The end of the thermostat, which is bolted or otherwise secured to the casing, is bent at an angle, and the upper and lower sides of the
 20 said thermostat are arranged as close together as possible without actually touching. The metals may be arranged to pull the rod upward or downward, and when it is desired to pull downward on the lever the metal which
 25 expands the most is arranged inside the thermostat. If it is desired to move the rod upward to effect the closing of the damper, the metals are reversed, the one having the greatest expansion being arranged on the exterior
 30 of the thermostat. The rod 11^b has its upper end threaded for the reception of an adjusting-nut 11^c, whereby the operation of the damper by the thermostat may be readily controlled.

35 Beneath the hot-air drum is arranged a device for distributing pure moist air to the egg compartment or chamber, and this distributor 16 consists of a circular bottom 17, spaced from the bottom of the hot-air drum by a se-
 40 ries of curved strips or partitions 18, arranged similar to the curved walls or partitions of the hot-air drum and like the blades of a turbine wheel, and these curved walls or parti-
 45 tions are adapted to cause a circulation of pure fresh air, which is warmed by the means hereinafter described before it is delivered into the egg compartment or chamber. The curved walls or flanges of the distributor 16
 50 cause a radial circulation of the pure fresh air, which is thoroughly diffused throughout the egg-chamber and around the eggs, and the said walls or flanges 18, which form the partitions of the distributor, may be disposed
 55 in the same general direction as the walls or partitions of the drum or they may be reversely arranged. The horizontal pure-air distributor terminates short of the outer wall of the drum, and its top wall is formed by the said drum.

60 The pure fresh air enters at the bottom of the incubator through short concentric tubes 19 and 20, spaced from the central flue and forming inner and outer passages, and the bottom of the distributor is provided at the
 65 upper ends of the said passages with inner and outer perforations 21 and 22. The concentric tubes, which communicate with the

interior of the distributor 16, form jackets around the flue and assist in preventing the central portion of the incubator from being
 70 excessively heated by the hot air passing upward from the flue to the drum, and the air passing upward through the concentric tubes 19 and 20 is heated before entering the dis-
 75 tributer. The air in the inner tube 19 will be heated to a higher degree than the air which passes upward through the outer tube 20; but the air from both of these tubes 19 and 20 will commingle in the distributor before entering
 80 the egg compartment or chamber.

The desired amount of moisture is supplied to the interior of the incubator by means of a vertically-adjustable receptacle or pan 24, mounted on the lower depending portion of the flue and provided with a centrally-ar-
 85 ranged sleeve 25, extending upward from the bottom of the pan or receptacle and fitting on the said flue. The frictional engagement of the pan, or rather the sleeve 25 thereof, with the flue is sufficient to hold it at any desired
 90 adjustment; but a set-screw or any other suitable fastening device may be provided for positively clamping or fastening the pan at the desired elevation. The air passing up-
 95 ward through the inner and outer concentric tubes will pass over the open mouth of the pan or receptacle 24 and will carry the moisture upward into the incubator.

The foul air which drops to the bottom of the body or compartment passes outward
 100 through numerous openings 27, extending through the walls of the body or casing. The escape of the foul air is controlled by an exterior band 28, arranged on the casing or body a short distance above the bottom thereof
 105 and provided with openings 29, adapted to register to a greater or less extent with the openings 27, whereby the size of the ventilating-openings may be changed. The ring or band 28 is adapted to slide around the casing
 110 or body, and it is designed to be provided with a set-screw or other suitable device for holding it in its adjusted position. By adjusting the band on the exterior of the body or casing the supply of fresh air through the
 115 inner and outer concentric tubes is controlled and such pure fresh air may be supplied to the egg chamber or compartment at such times and in such quantities as the operator desires, and it is thoroughly and uniformly
 120 diffused throughout the egg-chamber and around the eggs by the turbine arrangement of walls or partitions within the distributor 16.

It will be seen that the devices for distrib-
 125 uting the hot air and the pure fresh warm air are simple and comparatively inexpensive in construction, that the hot air is introduced into the incubator at the center thereof without excessively heating the incubator at that point, and that the eggs are compactly
 130 arranged around the central flue and are brought closer to the source of heat, whereby a small amount of heat is required and the cost of heating reduced to a minimum. It

will also be apparent that the egg chamber or compartment may be maintained at a uniform temperature and that the parts may be readily adjusted to control the temperature of the said egg chamber or compartment. Furthermore, it will be apparent that by arranging the water pan or receptacle on the exterior of the incubator it is always surrounded by pure air and is readily accessible and that it may be readily adjusted vertically to control the amount of moisture carried upward by the fresh air.

What I claim is—

1. In an incubator, the combination of a casing, a hot-air flue extending through the bottom of the casing, a hot-air drum located within the casing and connected with the flue and provided with curved partitions arranged radially, said drum being also connected with the exterior of the said casing, and means for controlling the passage of the hot air, substantially as and for the purpose described.

2. In an incubator, the combination of a casing, a hot-air flue extending through the casing, a hot-air drum centrally connected with the flue and arranged within the casing and provided with radial partitions and having outlets at its periphery extending through the casing, and means for controlling the passage of the hot air, to cause the same to pass directly through the flue or to circulate through the drum, substantially as described.

3. In an incubator, the combination of a casing, a hot-air drum located within the casing and provided with curved partitions arranged radially, the hot-air flue extending through the bottom of the casing and connected with the drum, the short pipe extending from the drum through the top of the casing, the pure-air distributor arranged horizontally to meet the drum and terminating short of the outer walls thereof and provided with partitions, and a sleeve surrounding the hot-air tube and connected with the pure-air distributor, substantially as described.

4. In a device of the class described, the combination of a casing, a hot-air flue, a hot-air drum, a pure-air distributor arranged beneath the drum and provided with radial partitions and being open at its periphery, and the concentric tubes surrounding the flue and forming passages communicating with the distributor, substantially as described.

5. In an incubator, the combination of a casing, a hot-air drum having top, bottom and side walls and arranged within the casing, a hot-air flue connected with the hot-air drum, a pure-air distributor disposed horizontally and arranged contiguous to the hot-air drum and composed of top and bottom walls, one of the walls being formed by the hot-air drum, said pure-air distributor being open at its perimeter, and means for connect-

ing the pure-air distributor with the exterior of the casing, substantially as described.

6. The combination of a casing, a flue, a hot-air drum arranged at the top of the flue and provided with curved partitions disposed radially, the fresh-air distributor located beneath the drum and having radially-arranged curved partitions, and the concentric tubes surrounding the flue and forming passages communicating with the distributor, substantially as described.

7. In a device of the class described, the combination of a casing, a flue depending therefrom, a hot-air drum connected with the flue, a pure-air distributor located beneath the drum, a tube surrounding the flue and forming a passage communicating with the distributor, and a vertically-adjustable water-receptacle mounted on the flue at the exterior of the casing, substantially as and for the purpose described.

8. In a device of the class described, the combination of a casing, a flue depending from the bottom of the casing, a fresh-air passage extending upward from the bottom of the casing, and a vertically-adjustable water-receptacle having a sleeve arranged on the lower portion of the flue, substantially as described.

9. In an incubator, the combination of a casing having a lower egg-compartment, a flue extending entirely through the casing, a horizontal hot-air drum centrally connected with the flue and provided near its side walls with outlets extending through the top of the casing, a horizontal pure-air distributor provided with partitions and located beneath and arranged contiguous to and having its top wall formed by the drum, whereby the air will be heated, and a tube surrounding the flue and communicating with the pure-air distributor, substantially as described.

10. In a device of the class described, the combination of a casing provided with means for supplying it with fresh air and having ventilating-openings, a band surrounding the casing and provided with openings adapted to register to a greater or less extent with the ventilating-openings, and means for heating the casing, substantially as described.

11. An incubator provided with a pure-air distributor located within the incubator and connected with the exterior thereof, said pure-air distributor being open at its perimeter and provided with partitions, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

MILTON L. TRESTER.

Witnesses:

O. B. POLK,

E. R. MORRISON.